



# **Treatment Technology Vendor Information Form (VIF) Version 7.0**

To be completed for participation in the

## **Search Engine Linking Environmental Characterization and Treatment Technologies (Tech SELECTT)**

### **Version 1.0**

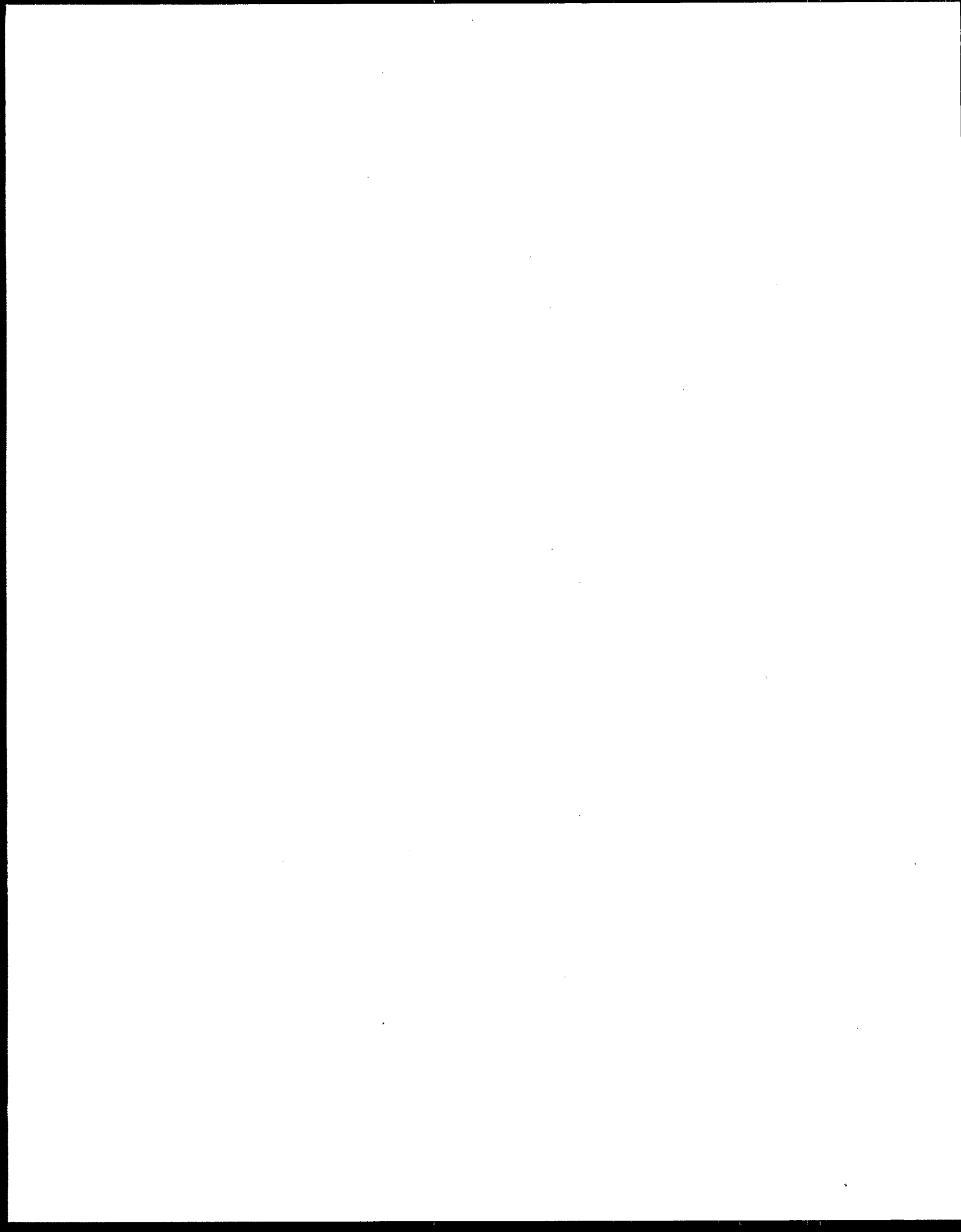
**Note:** Instead of submitting this form, you may provide information on your technology(ies) electronically. The VIF can be completed on-line at [www.ttemi.com/techselectt](http://www.ttemi.com/techselectt). An electronic VIF can be downloaded from EPA's CLU-IN web site ([www.clu-in.com](http://www.clu-in.com)). Or you may call the VISITT/Vendor FACTS help line to request a hard copy.

*Completion of this form is voluntary. If you  
have any questions, call the Tech SELECTT  
Help Line at (800) 245-4505 or (703) 287-8927*

Form Approved  
OMB Control No. 2050-0114  
Approval expires 08/31/2000



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## **I. What is the Search Engine Linking Environmental Characterization and Treatment Technologies?**

The Search Engine Linking Environmental Characterization and Treatment Technologies (Tech SELECTT) is a service offered by the U.S. Environmental Protection Agency's (EPA) Technology Innovation Office (TIO) to promote the use of technologies for the treatment, characterization or monitoring of contaminated ground water and soil. The predecessor systems, VISITT Version 6.0 (371 technologies provided by 214 vendors), and Vendor FACTS Version 3.0, (154 Technologies provided by 116 vendors) were released in January 1998. The purpose of the system is to foster communication between technology vendors and users by providing information on the availability, performance, and cost associated with the application of characterization and treatment technologies. Tech SELECTT is intended to inform Federal, state, and private-sector remediation professionals of their cleanup options and the capabilities of the firms listed in the system's database to provide remediation services.

## **II. Which Treatment Technologies are Eligible for Inclusion?**

Eligible technologies are those that are:

1. Innovative, that is, technologies that lack cost and performance data and currently are not applied commonly, when their use can provide better, more cost-effective performance than conventional methods.
2. Designed to treat contaminated soil, sludge, sediments, solid-matrix and to treat ground water or nonaqueous phase liquids (NAPL) in situ. (See Table 1.1)
3. In the category transportable thermal destruction or solidification/stabilization. These two conventional technology categories are being added to the list of eligible technologies to expand on the treatment options available to users of the system.

Treatment technologies associated with groundwater ex situ systems and incineration at a fixed location continue to be ineligible technology categories.

Suppliers of separate components of a treatment technology (such as bacteria for bioremediation) will not be listed in the database. EPA will determine whether a technology is eligible for listing, if so requested by the vendor. Questions about the eligibility of a given technology can be directed to the Tech SELECTT help line at (800) 245-4505 or (703) 287-8927.

## **III. Why Should You Participate?**

1. Tech SELECTT is an excellent opportunity for vendors to promote their capabilities. The system allows the vendor to provide substantial information on the applicability, cost, performance, and current use of their technologies. The database will be publicly available free-of-charge on the Internet. We anticipate reaching cleanup personnel and investors throughout the U.S. and abroad by widely advertising Tech SELECTT in trade journals, at conferences, and through direct mailings to an extensive list of potential users.

**Table 1.1**  
**LIST OF TREATMENT TECHNOLOGIES OF INTEREST**

Acid Extraction	Hydraulic Fracturing
Adsorption - In Situ	Magnetic Separation
Air Sparging - In Situ Ground Water	Materials Handling/Physical Separation
Bioremediation - In Situ Ground Water	Off-Gas Treatment
Bioremediation - In Situ Lagoon	Plasma
Bioremediation - In Situ Soil	Pneumatic Fracturing
Bioremediation - Not Otherwise Specified	Pyrolysis
Bioremediation - Slurry Phase	Slagging - Off-Gas Treated
Bioremediation - Solid Phase	Soil Flushing - In Situ
Bioventing	Soil Vapor Extraction
Chemical Treatment - Dechlorination	Soil Washing
Chemical Treatment - In Situ Ground Water	Solidification/Stabilization
Chemical Treatment - Other	Solvent Extraction
Chemical Treatment - Oxidation/Reduction	Surfactant Enhanced Recovery - In Situ
Delivery/Extraction Systems	Thermal Desorption
Dual-Phase Extraction	Thermally Enhanced Recovery - In Situ
Electrical Separation	Transportable Thermal Destruction
Electro-Thermal Gasification - In Situ	Vitrification

#### **IV. Should Vendors Submit Confidential Business Information?**

No. Submittal of technology information for inclusion in Tech SELECTT is voluntary, and submittals should not include confidential business information. However, applicants may write "available on a case-by-case basis" as their response to those questions for which they have information, but would prefer not to make this information generally available.

For confidential projects that otherwise could not be included, applicants are encouraged to provide "sanitized" or masked information that will allow users to review general information on a vendor's experience, without revealing confidential information. For instance, in Part 6, which details project experience, you may provide a generic industry name, such as "organic chemical manufacturer" instead of the actual site name.

#### **V. Submittal of Process Flow Diagrams, Schematics, or Pictures**

Vendors should provide a flow chart, schematic, or picture of the treatment process or equipment. To ensure that schematics are legible in the final system, EPA recommends that schematics be submitted in an Encapsulated Postscript (EPS), Bitmap (BMP), Tag Image File (TIF) or Zsoft PC Paintbrush Bitmap (PCX) electronic format. If no electronic copy is available, a camera-ready hard copy suitable for computer scanning is acceptable.

## **VI. How Much Documentation is Required Regarding Performance and Other Technology Claims?**

The treatment technology portion of Tech SELECTT is a service provided by EPA to showcase vendor's technologies and capabilities. Therefore, it is in the applicant's best interest to fill out each part of VIF as completely as possible since incomplete information may discourage users from considering the technology further.

EPA will review each submittal for clarity, completeness, and adherence to instructions and may contact vendors to clarify information submitted. If the Agency makes any substantive changes to the submittal the respondent will be given the opportunity to review and comment, with one exception: EPA may list publicly-available information or references on Superfund sites or Federal facilities at which the vendor's technology has been used.

The Agency will not review submitted data for accuracy or quality; to do so would be too resource intensive and subjective, and would substantially delay dissemination of the database. Tech SELECTT will clearly state that vendors have supplied the information, and that the data have not been verified by the Agency. Applicants should expect that interested users may request additional information regarding applicability and performance of a particular technology. The database will contain the following disclaimer:

"Inclusion in the U.S. Environmental Protection Agency's Tech SELECTT database does not mean that the Agency approves, recommends, licenses, certifies, or authorizes the use of any of the technologies. Nor does the Agency certify the accuracy of the data. This listing means only that the vendor has provided information on a technology that EPA considers to be eligible for inclusion in this database."

## **VII. Submittal of Vendor Information Form**

Instead of submitting this form, it is recommended that you use the on-line VIF at [www.ttemi.com/techselectt](http://www.ttemi.com/techselectt) for submitting your technology for inclusion in Tech SELECTT. However, there are several other ways you may provide information on your technology(ies). The VIF can be downloaded from the Tech SELECTT homepage at [www.ttemi.com/techselectt](http://www.ttemi.com/techselectt) or from the EPA's Cleanup Information (CLU-IN) web site at [www.clu-in.com](http://www.clu-in.com). You can also obtain the VIF by electronic mail. Send your request to [visitt@ttemi.com](mailto:visitt@ttemi.com). A hard copy of the VIF can be obtained by calling the Tech SELECTT help line at (800) 245-4505. The VIF may also be handwritten and submitted to the address below.

System Operator, Tech SELECTT  
Tetra Tech EM, Inc.  
1593 Spring Hill Road, Suite 300  
Vienna, VA 22182

### **VIII. EPA's Authority for Invitation for Submittal and Burden Statement**

EPA's authority for conducting this invitation for submittal is set forth under section 311 of the Superfund Amendments and Reauthorization Act of 1986 (42 United States Code (U.S.C.) 9601 *et seq.*). Under section 311, EPA may collect and disseminate information related to the use of treatment technologies for remediation of hazardous waste sites.

EPA estimates that the burden of reporting on the vendor for this collection of information will average 25 hours for each original submittal and 13 hours for submittal of an update. These estimates include the time applicants will require to review and maintain necessary data and to complete and review the VIF. Comments about this estimate of burden, or any other issue or concern related to reduction of the burden, should be sent to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460 and to Paperwork Reduction Project (OMB#2050-0114), Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

**IX. TREATMENT TECHNOLOGIES FOR  
TECH SELECTT  
(FORMERLY VISITT)**

**TREATMENT TECHNOLOGY VENDOR INFORMATION FORM 7.0**

**PART 1: GENERAL INFORMATION**

Part 1 contains questions about general information on your company. Part 1 must be completed for a technology to be included in Tech SELECTT.

1.1 Date Submitted \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

1.2 Developer/Vendor Name \_\_\_\_\_

1.3a Is this an update of a technology listed in VISITT Version 6.0? Yes ☐ No ☐

If yes, specify technology and vendor name that appeared in VISITT Version 6.0 if different from the information in this update.

**For VISITT Version 6.0 Vendors:** Questions 1.3b and 1.3c are intended to gather information on the use of VISITT in the remediation community.

1.3b Please provide an estimate of the frequency of inquiries your company has received through your inclusion in VISITT. \_\_\_\_\_ (value) \_\_\_\_\_ (unit)

1.3c Has your company performed work, such as a treatability study, pilot-scale study, or field demonstration, as a result of those inquiries. ☐ Yes ☐ No

Please provide details, if possible. \_\_\_\_\_

1.4 Please list your primary Standard Industrial Classification (SIC) code and check the appropriate business classification for each code. Refer to Appendix A for business classification definitions.

SIC code \_\_\_\_\_ ☐ Small ☐ Other Than Small ☐ Disadvantaged/Minority ☐ Women-owned  
SIC code \_\_\_\_\_

Vendor Name \_\_\_\_\_  
Technology Type \_\_\_\_\_

**PART 1: GENERAL INFORMATION (continued)**

1.5 Street Address \_\_\_\_\_  
\_\_\_\_\_

1.6 City \_\_\_\_\_

1.7 State/Province \_\_\_\_\_

1.8 Zip Code \_\_\_\_\_

1.9 Country \_\_\_\_\_

1.10 a. Contact Name(s) Prefix: \_\_\_\_\_ First Name: \_\_\_\_\_

Last Name: \_\_\_\_\_ Suffix: \_\_\_\_\_

b. Contact Title(s) \_\_\_\_\_

1.11 Contact Phone ( ) \_\_\_\_\_ - \_\_\_\_\_ ext. \_\_\_\_\_

1.12 Fax Number ( ) \_\_\_\_\_ - \_\_\_\_\_

1.13 Internet E-mail Address \_\_\_\_\_

1.14 Home Page Address \_\_\_\_\_

## PART 2: TECHNOLOGY OVERVIEW

Part 2 asks questions about the technology type, trade name, patent information, technology description, highlights, limitations, media treated, contaminants treated as well as other general questions related to a vendor's technology. Part 2 must be completed for a technology to be included in Tech SELECTT.

### 2.1 Vendor Services. Check all that apply.

- ☐ Equipment manufacturer
- ☐ Subcontractor for cleanup services
- ☐ Prime contractor for full-service remediation
- ☐ Technology sales
- ☐ Technology rentals or leases
- ☐ Other (specify) \_\_\_\_\_

### 2.2 Technology Type. Check one only. Fill out a separate form for each additional technology.

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Acid Extraction                          | <input type="checkbox"/> Chemical Treatment - Dechlorination       | <input type="checkbox"/> Off-Gas Treatment                      |
| <input type="checkbox"/> Adsorption - In Situ                     | <input type="checkbox"/> Chemical Treatment - In Situ Ground Water | <input type="checkbox"/> Plasma                                 |
| <input type="checkbox"/> Air Sparging - In Situ Ground Water      | <input type="checkbox"/> Chemical Treatment - Other                | <input type="checkbox"/> Pyrolysis                              |
| <input type="checkbox"/> Bioremediation - In Situ Ground Water    | <input type="checkbox"/> Chemical Treatment - Oxidation/Reduction  | <input type="checkbox"/> Slagging - Off-Gas Treated             |
| <input type="checkbox"/> Bioremediation - In Situ Lagoon          | <input type="checkbox"/> Delivery/Extraction Systems               | <input type="checkbox"/> Soil Flushing - In Situ                |
| <input type="checkbox"/> Bioremediation - In Situ Soil            | <input type="checkbox"/> Dual-Phase Extraction                     | <input type="checkbox"/> Soil Vapor Extraction                  |
| <input type="checkbox"/> Bioremediation - Not Otherwise Specified | <input type="checkbox"/> Electrical Separation                     | <input type="checkbox"/> Soil Washing                           |
| <input type="checkbox"/> Bioremediation - Slurry Phase            | <input type="checkbox"/> Electro-Thermal Gasification - In Situ    | <input type="checkbox"/> Solidification/Stabilization           |
| <input type="checkbox"/> Bioremediation - Solid Phase             | <input type="checkbox"/> Fracturing - Pneumatic                    | <input type="checkbox"/> Solvent Extraction                     |
| <input type="checkbox"/> Bioventing                               | <input type="checkbox"/> Fracturing - Hydraulic                    | <input type="checkbox"/> Surfactant Enhanced Recovery - In Situ |
|   | <input type="checkbox"/> Magnetic Separation                       | <input type="checkbox"/> Thermal Desorption                     |
|   | <input type="checkbox"/> Materials Handling/ Physical Separation   | <input type="checkbox"/> Thermally Enhanced Recovery - In Situ  |
|   |  | <input type="checkbox"/> Transportable Thermal Destruction      |
|   |  | <input type="checkbox"/> Vitrification                          |
| <input type="checkbox"/> Other (specify) _____                    |  |   |

### 2.3 Trade Name and/or Model Number Assigned By Vendor (if different than Technology Type).

\_\_\_\_\_

- 2.4 Is this a registered Trademark? ☐ Yes ☐ No
- 2.5 Does the vendor hold an exclusive license? ☐ Yes ☐ No

**PART 2: TECHNOLOGY OVERVIEW (continued)**

**2.6 Patents**

- a. Is technology patented? ☐ Yes ☐ No
- b. Is patent pending? ☐ Yes ☐ No

**2.7 Technology Scale. Check only one.** Using the following definitions, indicate the operational status of the technology.

- a. ☐ **Full scale.** Available equipment is sized and commercially available for actual site remediation. (If you select full scale, you must fill out *Part 3*).
- b. ☐ **Pilot scale.** Available equipment is of sufficient size to verify technology feasibility or establish the design and operating conditions for a full-scale system. However, it is not of the size typically used for a cleanup. (If you select pilot scale, you must fill out *Part 4*).
- c. ☐ **Bench scale or emerging.** Technology has been shown to be feasible through the use of bench-top equipment in the laboratory. Data from these studies cannot be used to scale up the technology to full scale. (If you select bench scale, you must fill out *Part 5*).

**2.8a. Is this technology in the Superfund Innovative Technology Evaluation (SITE) Program.**

- ☐ Yes ☐ No

**b. Is this technology being tested, or has this technology been tested, in EPA SITE Emerging Technology Program?**

- ☐ Yes ☐ No

EPA Project Manager: \_\_\_\_\_

SITE Document Number(s): \_\_\_\_\_

**c. Is this technology being tested, or has this technology been tested, in EPA SITE Demonstration Program?**

- ☐ Yes ☐ No

EPA Project Manager: \_\_\_\_\_

SITE Document Number(s): \_\_\_\_\_

## PART 2: TECHNOLOGY OVERVIEW (continued)

- 2.9 **Description of Technology.** In 300 words or less, describe the treatment process, including scientific principles on which the technology is based; key treatment steps; unique and innovative features; whether full-scale system is/will be batch, continuous, or semicontinuous; and whether the technology is above ground or in situ. *Parts 3 and 4* allow more detail for full- and pilot-scale systems. **Provide a flow chart or schematic of the treatment process, showing the equipment necessary for each step. To ensure the schematics are legible in the final system, EPA recommends that schematics be submitted in an Encapsulated Postscript (EPS) Bitmap (BMP), Tag Image File (TIF) or Zsoft PC Paintbrush Bitmap (PCX) electronic format. If an electronic copy is not available, a camera-ready hard copy suitable for computer scanning can be submitted as an alternative.**

### EXAMPLE

#### Description of Technology

ABC Corporation has developed an innovative solvent extraction technology (SUPER) that uses Super Chemical as the solvent. Super Chemical is a biodegradable solvent.

The key to success of this process is Super Chemical's property of inverse miscibility; below 65 degrees F, Super Chemical is soluble in water (hydrophilic) and above 65 degrees F, it is insoluble in water (hydrophobic). Therefore, cold Super Chemical can extract water and water-soluble compounds, and warm Super Chemical can extract organic contaminants, such as PCBs, pesticides, PAHs, SVOCs, and VOCs.

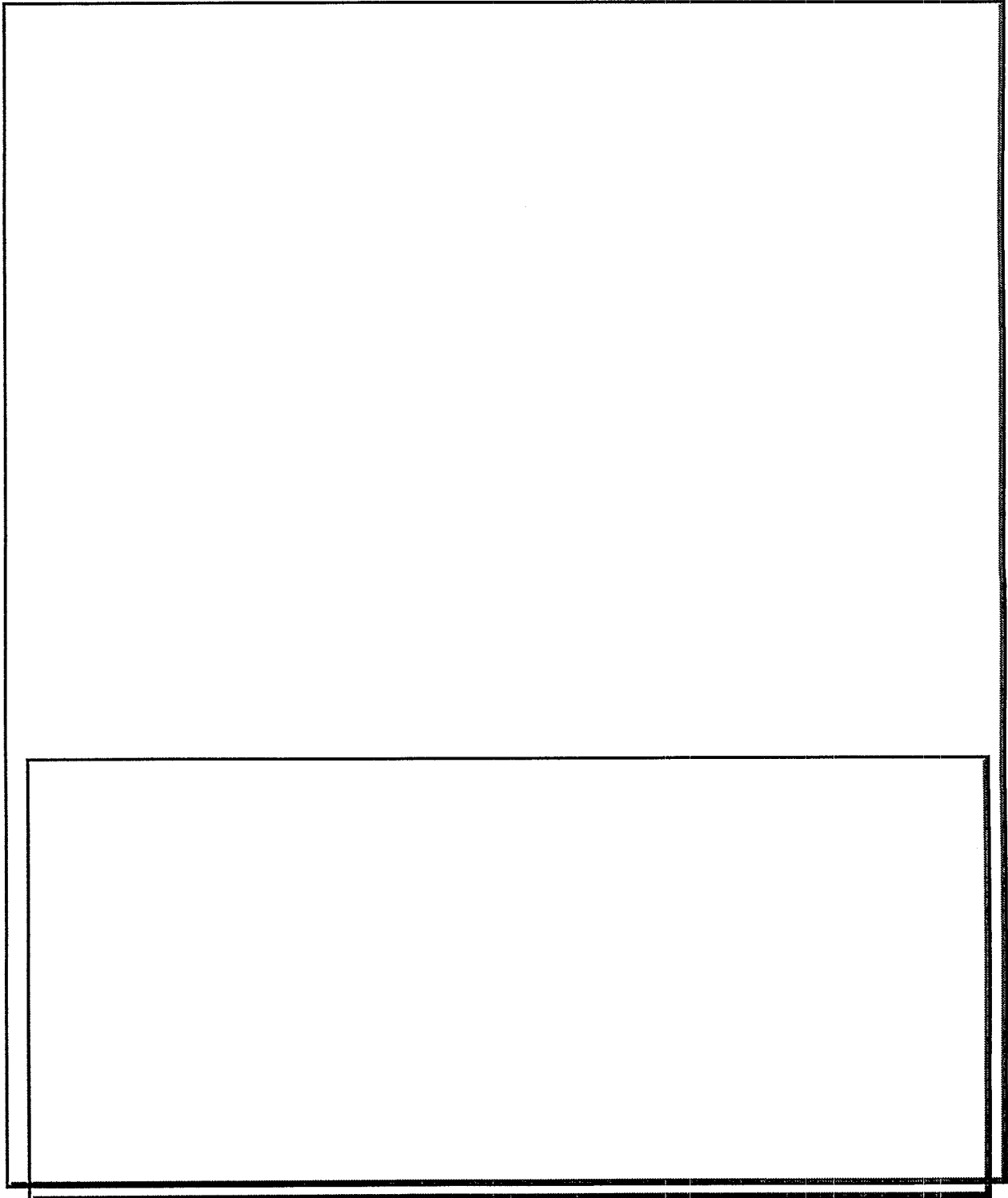
Within the unit, the soil is washed continuously with Super Chemical in a counter-current process. The contaminants dissolve in the solution and are removed from the soil by the counter-current flow. The contaminated solvents are reclaimed in a closed-loop circuit, eliminating the need for large volumes of solvent. The clean, washed soil is moved to a closed-loop dryer system, where any excess solvent is removed from the soil. When the soil exits the system, it is relatively free of organics and dry. The collected contaminant from the solvent washing is concentrated 1,000 to 10,000 times, reducing its volume and its associated disposal costs, and is pumped periodically from the system into labeled 55-gallon drums for conventional off-site disposal.

Emissions of organic vapors to air are controlled and treated by a carbon absorption system.

Vendor Name \_\_\_\_\_  
Technology Type \_\_\_\_\_

**PART 2: TECHNOLOGY OVERVIEW (continued)**

**2.9 Description of Technology (*continued*).**



**PART 2: TECHNOLOGY OVERVIEW (continued)**

- 2.10 Technology Highlights.** In 200 words or less, describe the key marketable features of the technology in terms of contaminants treated, performance, implementation, or cost. Include highlights such as treatment niche and advantages over other technologies.

**EXAMPLE**

**Technology Highlights**

The SUPER solvent extraction process can treat soils, sludges, and sediments contaminated with PCBs, carcinogenic PAHs, pesticides, and VOCs at 20 percent to 40 percent of incineration costs. Treated products from the SUPER process include: water suitable for discharge, oil for recycle as fuel, and solids that can be returned to the site as backfill. The process also can reduce the initial volume of contaminated material by as much as 90 percent.

The SUPER solvent extraction process operates at near ambient pressures and temperatures, uses off-the-shelf process equipment, and controls air emissions. The extraction efficiency (organic removal efficiency) achieved is as high as 99 percent.

Solvent recovery is also greater than 99 percent. The process can treat up to 300 tons per day of contaminated soil. This technology is well accepted by communities because air emissions are minimized.

Vendor Name \_\_\_\_\_

Technology Type \_\_\_\_\_

## PART 2: TECHNOLOGY OVERVIEW (continued)

- 2.11 **Technical Limitations.** In 200 words or less, describe the technical limitations such as specific contaminants or contaminant combinations, temperature, moisture content, or chemical properties of the contaminant, that could adversely affect applicability or performance.

### EXAMPLE

#### Technology Limitations

The SUPER process is not applicable for metal-only, radioactive, high-concentration or other inorganic wastes, but its performance is not affected by non radioactive inorganics at low concentrations. This process may require screening or crushing to 0.25 inch, and other feed preparation operations, depending on the waste. The extraction efficiency of an organic contaminant will depend on its solubility in the solvent. The solvent used is best suited for PCBs and pesticides.

**PART 2: TECHNOLOGY OVERVIEW (continued)**

- 2.12 Other Comments.** In 200 words or less, provide additional information about the technology, such as its history, status, capabilities, and experience and applicable permits obtained (for example, TSCA or RCRA). Also describe plans for future development of the technology, including diversification of media and/or contaminants treated.

**EXAMPLE**

**Other Comments**

The SUPER process has been demonstrated successfully at bench scale, pilot scale, and full scale. A full-scale SUPER unit was used to treat sludges contaminated with PCBs at the BAD Oil Refining Superfund site.

Two pilot-scale units have been built. One was operated under the SITE program to treat soils and sludges contaminated with PCBs.

Bench-scale treatability studies have been conducted on contaminated soils containing petrochemical compounds, pharmaceutical compounds, pesticides, PCBs, and wood-preserving wastes containing PAHs.

**PART 2: TECHNOLOGY OVERVIEW (continued)**

**2.13 Media treated.** Check "actual" for all media that have been treated by your technology. Check "potential" for all media to which the technology may be applied in the future.

Actual	Potential
<input type="checkbox"/>	<input type="checkbox"/> Soil (in situ)
<input type="checkbox"/>	<input type="checkbox"/> Soil (ex situ)
<input type="checkbox"/>	<input type="checkbox"/> Sludge (does not include municipal sewage sludge)
<input type="checkbox"/>	<input type="checkbox"/> Solid (for example, slag)
<input type="checkbox"/>	<input type="checkbox"/> Saturated sediment (in situ)
<input type="checkbox"/>	<input type="checkbox"/> Saturated sediment (ex situ)
<input type="checkbox"/>	<input type="checkbox"/> Ground water (in situ) [Includes treatment of ground water and/or saturated soil]
<input type="checkbox"/>	<input type="checkbox"/> Off-gas generated from a primary innovative treatment technology
<input type="checkbox"/>	<input type="checkbox"/> Dense nonaqueous phase liquids (DNAPL) [in situ]
<input type="checkbox"/>	<input type="checkbox"/> Light nonaqueous phase liquids (LNAPL) [in situ]
<input type="checkbox"/>	<input type="checkbox"/> Other: _____

Vendor Name \_\_\_\_\_

Technology Type \_\_\_\_\_

**PART 2: TECHNOLOGY OVERVIEW (continued)**

- 2.14 **Contaminant Groups Treated.** *Check all that may apply.* Check "actual" for all that have been treated by your technology (that is, data exist). Check "potential" for all that the technology may be applied to in the future. Data for actual contaminants treated should be included in *Part 6* (see Appendix B for key to contaminant groups). If your technology is materials handling/physical separation, delivery/extraction, or if you are an equipment vendor, this question may not apply.

**Actual Potential**

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Halogenated volatiles                      |
| <input type="checkbox"/> | <input type="checkbox"/> | Halogenated semivolatiles                  |
| <input type="checkbox"/> | <input type="checkbox"/> | Nonhalogenated volatiles                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Nonhalogenated semivolatiles               |
| <input type="checkbox"/> | <input type="checkbox"/> | Organic pesticides/herbicides              |
| <input type="checkbox"/> | <input type="checkbox"/> | Dioxins/furans                             |
| <input type="checkbox"/> | <input type="checkbox"/> | PCBs                                       |
| <input type="checkbox"/> | <input type="checkbox"/> | Polynuclear aromatic hydrocarbons (PAHs)   |
| <input type="checkbox"/> | <input type="checkbox"/> | Solvents                                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Benzene-toluene-ethylbenzene-xylene (BTEX) |
| <input type="checkbox"/> | <input type="checkbox"/> | Acetonitrile (organic cyanide)             |
| <input type="checkbox"/> | <input type="checkbox"/> | Organic acids                              |

**Actual Potential**

- |                          |                          |                                      |
|--------------------------|--------------------------|--------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Heavy metals                         |
| <input type="checkbox"/> | <input type="checkbox"/> | Nonmetallic toxic elements           |
| <input type="checkbox"/> | <input type="checkbox"/> | Radioactive metals                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Asbestos                             |
| <input type="checkbox"/> | <input type="checkbox"/> | Inorganic cyanides                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Inorganic corrosives                 |
| <u>Miscellaneous</u>     |                          |                                      |
| <input type="checkbox"/> | <input type="checkbox"/> | Explosives/propellants               |
| <input type="checkbox"/> | <input type="checkbox"/> | Medical wastes                       |
| <input type="checkbox"/> | <input type="checkbox"/> | Organometallic pesticides/herbicides |
| <input type="checkbox"/> | <input type="checkbox"/> | Other (specify) _____                |
- \_\_\_\_\_

Vendor Name \_\_\_\_\_  
Technology Type \_\_\_\_\_

## PART 2: TECHNOLOGY OVERVIEW (continued)

**2.15 Industrial Waste Sources or Site Types.** *Check all that apply.* Check "actual" for all that have been treated by your technology (that is, data exist). Check "potential" for all that the technology may be applied to in the future. Treatment data should be available for those sites for which "actual" is checked. See Table 2.1 for wastes typically associated with each industry.

### Actual Potential

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Agriculture   |
| <input type="checkbox"/> | <input type="checkbox"/> | Battery recycling/disposal                          |
| <input type="checkbox"/> | <input type="checkbox"/> | Chlor-alkali manufacturing                          |
| <input type="checkbox"/> | <input type="checkbox"/> | Coal gasification                                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Dry cleaning  |
| <input type="checkbox"/> | <input type="checkbox"/> | Electroplating                                      |
| <input type="checkbox"/> | <input type="checkbox"/> | Gasoline service station/petroleum storage facility |
| <input type="checkbox"/> | <input type="checkbox"/> | Herbicide manufacturing/use                         |
| <input type="checkbox"/> | <input type="checkbox"/> | Industrial landfills                                |
| <input type="checkbox"/> | <input type="checkbox"/> | Inorganic/organic pigments                          |
| <input type="checkbox"/> | <input type="checkbox"/> | Machine shops                                       |
| <input type="checkbox"/> | <input type="checkbox"/> | Medical wastes                                      |
| <input type="checkbox"/> | <input type="checkbox"/> | Metal ore mining and smelting                       |

### Actual Potential

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Municipal landfill                     |
| <input type="checkbox"/> | <input type="checkbox"/> | Munitions manufacturing                |
| <input type="checkbox"/> | <input type="checkbox"/> | Paint/ink formulation                  |
| <input type="checkbox"/> | <input type="checkbox"/> | Pesticide manufacturing/use            |
| <input type="checkbox"/> | <input type="checkbox"/> | Petroleum refining/reuse               |
| <input type="checkbox"/> | <input type="checkbox"/> | Photographic products                  |
| <input type="checkbox"/> | <input type="checkbox"/> | Plastics manufacturing                 |
| <input type="checkbox"/> | <input type="checkbox"/> | Pulp and paper industry                |
| <input type="checkbox"/> | <input type="checkbox"/> | Other organic chemical manufacturing   |
| <input type="checkbox"/> | <input type="checkbox"/> | Other inorganic chemical manufacturing |
| <input type="checkbox"/> | <input type="checkbox"/> | Semiconductor manufacturing            |
| <input type="checkbox"/> | <input type="checkbox"/> | Rubber manufacturing                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Wood preserving                        |
| <input type="checkbox"/> | <input type="checkbox"/> | Uranium mining                         |
| <input type="checkbox"/> | <input type="checkbox"/> | Other (specify) _____                  |

\_\_\_\_\_  
\_\_\_\_\_

**PART 2: TECHNOLOGY OVERVIEW (continued)**

**Table 2.1**  
**Contaminants/Wastes Associated With Industrial Waste Sources or Types of Sites**

Agriculture	: Pesticides
Battery recycling/disposal	: Lead (acid)
Chlor-alkali manufacturing	: Chlorine compounds, mercury
Coal gasification	: PAHs
Dry cleaning	: Solvents
Electroplating	: Chrome, metals
Herbicide manufacturing/use	: Pesticides
Industrial landfills	: Wastes from multiple sources
Inorganic/organic pigments	: Solvents, chrome, zinc
Machine shops	: Metals, oils
Medical wastes	: Metals, radioactive wastes
Metal ore mining and smelting	: Metals
Municipal landfills	: Wastes from multiple sources
Munitions manufacturing	: Explosives, lead
Paint/ink formulation	: Solvents, some metals (chrome, zinc)
Pesticide manufacturing/use	: Pesticides
Petroleum refining/reuse	: Petroleum, hydrocarbons, BTEX
Photographic products	: Silver, bromide, solvent
Plastics manufacturing	: Polymers, phthalates
Pulp and paper industry	: Chlorinated organics, dioxins
Other organic chemical manufacturing	: Organics, metals (used as catalyst)
Other inorganic chemical manufacturing	: Inorganics, metals
Semiconductor manufacturing	: Degreasing agents (solvents), metals
Rubber manufacturing	: Rubber, plastics, polymers, organics
Wood preserving	: Creosote, PCP, arsenic, chrome, PAHs
Uranium mining	: Uranium, radioactive metals

### PART 3: FULL SCALE EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response 2.7a (that is, technology is at full scale). You may also complete this part if the technology is at pilot scale.

- 3.1 **Major Unit Processes.** In 300 words or less, describe the steps and operation of the full-scale system, including a list of key components. Also describe any pre- and post-processing required by your technology. Provide more detail than you did in Question 2.9.

#### EXAMPLE

##### Major Unit Processes

###### Preprocessing

1. Front-end loader and weight scale
2. Shredder
3. Radial stacker belt conveyor and surge hopper
  - a. Stockpiled soil is transported to a weigh scale by a front-end loader.
  - b. Soil is deposited directly on a power shredding device. Classified soil with a top size of less than 2 inches passes through the shredder into the feed conveyor.
  - c. The feed conveyor is an enclosed radial stacker belt conveyor that is 18 inches wide and 60 feet long. The conveyor discharges into the surge hopper located above the thermal processor. The soil is fed into the LT system at regular intervals to maintain the surge hopper seal.

###### Processing

1. Thermal processor
2. Induced draft (ID) fan for vapors
3. Horizontal screw conveyor and ash conditioner
  - a. The thermal processor houses four intermeshed screw conveyors. The function of each screw conveyor is to move soil forward through the processor and to thoroughly mix the material, providing indirect contact between the heat transfer fluid and the soil. The shafts and flights of the screw conveyors and the processor jackets are hollow to allow circulation of a heat transfer fluid (that is, hot oil).
  - b. Vapors are driven off the soil and are drawn out of the thermal processor by an ID fan.
  - c. Soil is discharged from the thermal processor onto a horizontal screw conveyor and then an ash conditioner.
  - d. The conditioner is a ribbon flight screw conveyor. Water spray nozzles installed in the conditioner housing cool the discharge material and minimize fugitive dust emissions.

###### Postprocessing

1. Stacker belt conveyor and dump truck
  - a. The conditioner discharges onto an inclined stacker belt. The stacker belt conveys the wetted processed soil from the conditioner to the dump truck.

**Vendor Name** \_\_\_\_\_

Technology Type \_\_\_\_\_

### PART 3: FULL SCALE EQUIPMENT/CAPABILITIES

### 3.1 Major Unit Processes *(continued)*.

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. A vertical margin line is present on the left side, creating a narrow left margin. The paper appears to be from a notebook or a standard ruled document. There are no markings, text, or drawings on the page.

### PART 3: FULL SCALE EQUIPMENT/CAPABILITIES

**3.2a. Full-Scale Facility is (check one only)**

☐ Transportable                      ☐ Fixed                      ☐ In situ

b. City \_\_\_\_\_ and State \_\_\_\_\_ of fixed facility

**3.3 Number of Full-Scale Systems.**

\_\_\_\_\_ Planned/in design                      \_\_\_\_\_ Under construction                      \_\_\_\_\_ Constructed  
\_\_\_\_\_ Projected completion                      \_\_\_\_\_ Projected completion  
dates (mm/yyyy)                      dates (mm/yyyy)

**3.4 Capacity Range.**

\_\_\_\_\_ to \_\_\_\_\_ (units) ☐ Not applicable

**3.5 Estimated Price Range.** Provide a "ballpark" estimate per unit of waste treated. Include waste preprocessing and exclude excavation, permitting, and disposal of residues.

\$ \_\_\_\_\_ to \$ \_\_\_\_\_ per \_\_\_\_\_ (units)

**3.6 Factors Affecting Unit Price.** With "1" the highest, rank any of the following items that will have a significant effect on the unit price. If the technology is in situ, excavation and waste handling cannot affect price.

_____ Initial concentration of contaminant	_____ Site preparation
_____ Target concentration of contaminant	_____ Waste handling/preprocessing
_____ Quantity of waste	_____ Amount of debris with waste
_____ Depth of contamination	_____ Characteristics of soil (classification, permeability)
_____ Depth to ground water	_____ Utility/fuel rates
_____ Characteristics of residual waste	_____ Labor rates
_____ Moisture content of soil	

\_\_\_\_\_ Other (specify) \_\_\_\_\_

**3.7 Full-Scale Cleanups.**

a. If you are a subcontractor or prime contractor, give the number of full-scale cleanups using your technology that your firm has initiated or completed. Consider only those applications of your technology that were applied at petroleum/hazardous waste sites.

\_\_\_\_\_

b. If you are an equipment manufacturer, give the number of full-scale cleanups by other firms using your technology of which you are aware. Consider only those applications of your technology that were applied at petroleum/hazardous waste sites.

\_\_\_\_\_

## PART 4: PILOT-SCALE EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response Question 2.7b. You also may complete this part if the technology is at full scale or bench scale.

- 4.1 **Major Unit Processes.** In 200 words or less, describe the steps and operation of the pilot-scale treatment system, including a list of the key components. Also describe any pre- and post-processing required by your technology. Provide more detail than you did in Question 2.9.

### EXAMPLE

#### Major Unit Processes

Pilot-scale testing involves processing the soils or bulk soils through various operations of reduced-size equipment that when set in series, would be similar to a full-scale operation. The equipment consists of:

1. A hopper and screen for feed preparation; removal of tramp material and sizing, if needed.
2. A mixing or attrition tank where the prepared feed is introduced to the liquids. In the most basic system, extraction of contaminant takes place at this stage.
3. A classification circuit, consisting of a sump, pump, and cyclone for separation of coarse sand, gravel, and organics from fine clays and silts.
4. If extraction of contaminant so requires, coarse material is subjected to a specific gravity (SG) separation through use of a vessel, cyclone, or hydrosizer. Contaminated smaller size material (low SG) is separated from the clean, coarse (high SG) material.
5. Clean, coarse material is dewatered with a screen, although in full-scale operation, additional dryers (centrifuges) may be employed.
6. Low SG organics containing contaminant are dewatered with a screen and collected for disposal or secondary treatment.
7. Clays and silts are flocculated in a reaction tank and gravity-concentrated in a thickener or clarifier.
8. Thickened clays and silts containing contaminant are dewatered in a belt press and sent for disposal or secondary processing.
9. Recycled liquid from the thickening and dewatering process is collected and, in some cases, treated before it is returned to the mixing/attrition tank.

Vendor Name \_\_\_\_\_

Technology Type \_\_\_\_\_

## PART 4: PILOT-SCALE EQUIPMENT/CAPABILITIES

#### 4.1 Major Unit Processes *(continued)*.

--

4.2 a. Pilot-Scale Facility is (Check only one)

 **Transportable**

 Fixed

 In Situ

b. City \_\_\_\_\_ and State \_\_\_\_\_ of fixed facility.

### 4.3 Number of Pilot-Scale Systems

Planned/in design

Under construction

Constructed

Projected completion  
date (mm/yyyy)Projected completion  
date (mm/yyyy)

**4.4** How many times have you used this technology at your facility or at other locations to conduct pilot-scale studies on actual wastes? Count only once multiple studies pertaining to the same site, regardless of the number of different wastes or tests. Do not count tests on surrogate wastes.

---

4.5 a. Can you conduct pilot-scale treatability studies on some types of waste at your location?

☐ Yes☐ No

**b. At a contaminated site?**

☐ Yes☐ No

**4.6 Capacity Range.** Prorate capacity of batch processes. This range should be consistent with your answer to Question 4.7 (the waste requirement for the pilot-scale treatability study).

to (units)

☐ Not applicable

**4.7 Quantity of Waste Needed for Pilot-Scale Treatability Study.** Give the estimated range of quantity of waste needed to test, at the pilot scale, the feasibility of this technology on a specific waste.

to (units)

## PART 5: BENCH-SCALE OR EMERGING EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response Question 2.7c. You also may complete this part if the technology is at full scale or pilot scale.

5.1 Can you conduct bench-scale treatability studies on some types of waste at your location?

☐ Yes

☐ No

5.2 **Number of Bench-Scale Studies Conducted.** Estimate total number of bench-scale studies conducted on actual waste from different sources or sites. Count only once multiple studies pertaining to the same site, regardless of the number of different wastes or tests. Do not count tests on surrogate wastes.

\_\_\_\_\_

5.3 **Description of Bench-Scale Testing Procedures.** In 200 words or less, describe the type of test that would be performed to determine feasibility of this technology for treating a specific waste.

### EXAMPLE

#### Description of Bench-Scale Testing Procedures

In our feasibility assessment tests, we usually start with a sample of the soil to be treated and a knowledge of the nature and concentration of each contaminant as well as the effluent goals to be met. The following steps are then taken:

1. The optimal conditions for soil washing are studied, such as pH, time, and chelating agent and concentration.
2. Various likely adsorbents are studied on a batch basis to determine which are most effective at removing the metals of interest from the chelating agent in the washing water.
3. One or more selected media then are studied on columns to determine their ability to retain metals in a continuous-flow situation.
4. For the surviving adsorbent(s), the ion elution performance then is determined; after this step, one resin will have been selected as optimal for the particular task under study.
5. The selected adsorbent then is subjected to a number of charge and regeneration cycles to establish its ruggedness.

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## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

- 6.1 List as many as *five* representative projects that also can serve as references. List information for only one project per sheet. For projects that have more than one application, fill out a separate sheet for each application. Provide only the performance data that is specific to each project listed. Full- and pilot-scale projects are of most importance. EPA reserves the right to add information on projects conducted for the federal government of which EPA is aware.

Site Name (or Industry Type if Client Identity is Confidential): _____		
Site Type or Waste Source (Check all that apply)		
<input type="checkbox"/> Agriculture <input type="checkbox"/> Battery recycling/disposal <input type="checkbox"/> Chlor-alkali manufacturing <input type="checkbox"/> Coal gasification <input type="checkbox"/> Dry cleaning <input type="checkbox"/> Electroplating <input type="checkbox"/> Gasoline service station/petroleum storage facility <input type="checkbox"/> Herbicide manufacturing/use <input type="checkbox"/> Industrial landfills <input type="checkbox"/> Inorganic/organic pigments	<input type="checkbox"/> Machine shops <input type="checkbox"/> Medical wastes <input type="checkbox"/> Metal ore mining and smelting <input type="checkbox"/> Municipal landfill <input type="checkbox"/> Munitions manufacturing <input type="checkbox"/> Paint/ink formulation <input type="checkbox"/> Pesticide manufacturing/use <input type="checkbox"/> Petroleum refining/reuse <input type="checkbox"/> Photographic products <input type="checkbox"/> Plastics manufacturing <input type="checkbox"/> Pulp and paper industry <input type="checkbox"/> Other organic chemical manufacturing	<input type="checkbox"/> Other inorganic chemical manufacturing <input type="checkbox"/> Semiconductor manufacturing <input type="checkbox"/> Rubber manufacturing <input type="checkbox"/> Wood preserving <input type="checkbox"/> Uranium mining <input type="checkbox"/> Other (specify) _____
Location City _____ State/Province: _____ Country _____	Project took place at site named? _____ Yes _____ No	At another site (that is, a Test facility)? _____ Yes _____ No
Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	
<input type="checkbox"/> RCRA corrective action <input type="checkbox"/> CERCLA <input type="checkbox"/> TSCA <input type="checkbox"/> Safe Drinking Water Act <input type="checkbox"/> UST corrective action <input type="checkbox"/> State (specify) _____ <input type="checkbox"/> DoD <input type="checkbox"/> DOE <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Not Applicable	<input type="checkbox"/> Full-scale cleanup <input type="checkbox"/> Field demonstration <input type="checkbox"/> Pilot-scale treatability study <input type="checkbox"/> Bench-scale treatability study <input type="checkbox"/> RCRA Research, Development, and Demonstration <input type="checkbox"/> TSCA National Demonstration <input type="checkbox"/> TSCA Research and Development <input type="checkbox"/> EPA SITE Demonstration Program <input type="checkbox"/> EPA SITE Emerging Technology Program <input type="checkbox"/> Research <input type="checkbox"/> Other (specify) _____	
	Media Treated (Check all that apply)	
	<input type="checkbox"/> Soil (in situ) <input type="checkbox"/> Soil (ex situ) <input type="checkbox"/> Sludge <input type="checkbox"/> Solid (for example, slag) <input type="checkbox"/> Saturated sediment (in situ) <input type="checkbox"/> Saturated sediment (ex situ) <input type="checkbox"/> Ground water (in situ)	<input type="checkbox"/> Off-gas from a primary treatment technology <input type="checkbox"/> Dense nonaqueous phase liquids (DNAPL) [in situ] <input type="checkbox"/> Light nonaqueous phase liquids (LNAPL) [in situ] <input type="checkbox"/> Other: _____
Volume/Quantity Treated _____ (Units)	Equipment Scale (Check one only)	Project Status
	<input type="checkbox"/> Bench <input type="checkbox"/> Pilot <input type="checkbox"/> Full	Contracted Month(mm) _____ Year (yyyy) _____ Ongoing _____ Yes _____ No Completed Month(mm) _____ Year (yyyy) _____
Area treated (for in situ projects) _____ (Units)		
Depth treated (for in situ projects) _____ (Units)		

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

- Note:**
- (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.
  - (2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.
  - (4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

[illegible]

**PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA**

**6.2**

Site Name (or Industry Type if Client Identity is Confidential): _____		
<b>Site Type or Waste Source (Check all that apply)</b>		
<input type="checkbox"/> Agriculture <input type="checkbox"/> Battery recycling/disposal <input type="checkbox"/> Chlor-alkali manufacturing <input type="checkbox"/> Coal gasification <input type="checkbox"/> Dry cleaning <input type="checkbox"/> Electroplating <input type="checkbox"/> Gasoline service station/petroleum storage facility <input type="checkbox"/> Herbicide manufacturing/use <input type="checkbox"/> Industrial landfills <input type="checkbox"/> Inorganic/organic pigments	<input type="checkbox"/> Machine shops <input type="checkbox"/> Medical wastes <input type="checkbox"/> Metal ore mining and smelting <input type="checkbox"/> Municipal landfill <input type="checkbox"/> Munitions manufacturing <input type="checkbox"/> Paint/ink formulation <input type="checkbox"/> Pesticide manufacturing/use <input type="checkbox"/> Petroleum refining/reuse <input type="checkbox"/> Photographic products <input type="checkbox"/> Plastics manufacturing <input type="checkbox"/> Pulp and paper industry <input type="checkbox"/> Other organic chemical manufacturing	<input type="checkbox"/> Other inorganic chemical manufacturing <input type="checkbox"/> Semiconductor manufacturing <input type="checkbox"/> Rubber manufacturing <input type="checkbox"/> Wood preserving <input type="checkbox"/> Uranium mining  <input type="checkbox"/> Other (specify) _____
<b>Location</b>  City _____  State/Province: _____  Country _____	<b>Project took place at site named?</b>  <div style="text-align: center;"> <input type="checkbox"/> Yes   <input type="checkbox"/> No         </div>	<b>At another site (that is, a Test facility)?</b>  <div style="text-align: center;"> <input type="checkbox"/> Yes   <input type="checkbox"/> No         </div>
<b>Regulation/Statute/Organization (Check all that apply)</b>		
<input type="checkbox"/> RCRA corrective action <input type="checkbox"/> CERCLA <input type="checkbox"/> TSCA <input type="checkbox"/> Safe Drinking Water Act <input type="checkbox"/> UST corrective action <input type="checkbox"/> State (specify) _____ <input type="checkbox"/> DoD <input type="checkbox"/> DOE <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Not Applicable	<b>Application or Project Type (Check all that apply)</b>	
	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input type="checkbox"/> Full-scale cleanup  <input type="checkbox"/> Field demonstration  <input type="checkbox"/> Pilot-scale treatability study  <input type="checkbox"/> Bench-scale treatability study  <input type="checkbox"/> RCRA Research, Development, and Demonstration  <input type="checkbox"/> TSCA National Demonstration  <input type="checkbox"/> TSCA Research and Development  <input type="checkbox"/> EPA SITE Demonstration Program         </div> <div style="width: 30%;"> <input type="checkbox"/> EPA SITE Emerging Technology Program  <input type="checkbox"/> Research  <input type="checkbox"/> Other (specify) _____         </div> </div>	
	<b>Media Treated (Check all that apply)</b>	
	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <input type="checkbox"/> Soil (in situ)  <input type="checkbox"/> Soil (ex situ)  <input type="checkbox"/> Sludge  <input type="checkbox"/> Solid (for example, slag)  <input type="checkbox"/> Saturated sediment (in situ)  <input type="checkbox"/> Saturated sediment (ex situ)  <input type="checkbox"/> Ground water (in situ)         </div> <div style="width: 30%;"> <input type="checkbox"/> Off-gas from a primary treatment technology  <input type="checkbox"/> Dense nonaqueous phase liquids (DNAPL) [in situ]  <input type="checkbox"/> Light nonaqueous phase liquids (LNAPL) [in situ]  <input type="checkbox"/> Other: _____         </div> </div>	
<b>Volume/Quantity Treated</b>  _____ (Units)  <b>Area treated (for in situ projects)</b>  _____ (Units)  <b>Depth treated (for in situ projects)</b>  _____ (Units)	<b>Equipment Scale (Check one only)</b>	<b>Project Status</b>
	<input type="checkbox"/> Bench <input type="checkbox"/> Pilot <input type="checkbox"/> Full	<b>Contracted</b>  Month(mm) _____ Year (yyyy) _____  <b>Ongoing</b> <input type="checkbox"/> Yes <input type="checkbox"/> No  <b>Completed</b>  Month(mm) _____ Year (yyyy) _____

**Vendor Name** \_\_\_\_\_  
**Technology Type** \_\_\_\_\_

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

**Note:** (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data						
(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg

Conditions or interference adversely affecting performance \_\_\_\_\_

\_\_\_\_\_

Cost Information	
Estimated or actual total and/or unit cost for this project  \$ _____ per _____ (unit)  \$ _____ (total)	What items or activities are included or not included in these cost(s) (for example, mobilization, demobilization, excavation, waste handling)? _____ _____ _____

Person outside of company familiar with project (optional)  Name _____ Company _____  Address _____ _____ _____  Phone _____	Is Literature Available on this Project? (You may wish to include these citations in Part 6)  ___ Yes ___ No
--	--

Additional project information such as site conditions, mode of operation, and other pertinent information. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

### 6.3

Site Name (or Industry Type if Client Identity is Confidential): _____		
Site Type or Waste Source (Check all that apply)		
<input type="checkbox"/> Agriculture <input type="checkbox"/> Battery recycling/disposal <input type="checkbox"/> Chlor-alkali manufacturing <input type="checkbox"/> Coal gasification <input type="checkbox"/> Dry cleaning <input type="checkbox"/> Electroplating <input type="checkbox"/> Gasoline service station/petroleum storage facility <input type="checkbox"/> Herbicide manufacturing/use <input type="checkbox"/> Industrial landfills <input type="checkbox"/> Inorganic/organic pigments	<input type="checkbox"/> Machine shops <input type="checkbox"/> Medical wastes <input type="checkbox"/> Metal ore mining and smelting <input type="checkbox"/> Municipal landfill <input type="checkbox"/> Munitions manufacturing <input type="checkbox"/> Paint/ink formulation <input type="checkbox"/> Pesticide manufacturing/use <input type="checkbox"/> Petroleum refining/reuse <input type="checkbox"/> Photographic products <input type="checkbox"/> Plastics manufacturing <input type="checkbox"/> Pulp and paper industry <input type="checkbox"/> Other organic chemical manufacturing	<input type="checkbox"/> Other inorganic chemical manufacturing <input type="checkbox"/> Semiconductor manufacturing <input type="checkbox"/> Rubber manufacturing <input type="checkbox"/> Wood preserving <input type="checkbox"/> Uranium mining <input type="checkbox"/> Other (specify) _____
<b>Location</b> City _____ State/Province: _____ Country _____	<b>Project took place at site named?</b> _____ Yes _____ No	<b>At another site (that is, a Test facility)?</b> _____ Yes _____ No
Regulation/Statute/Organization (Check all that apply)		
<input type="checkbox"/> RCRA corrective action <input type="checkbox"/> CERCLA <input type="checkbox"/> TSCA <input type="checkbox"/> Safe Drinking Water Act <input type="checkbox"/> UST corrective action <input type="checkbox"/> State (specify) _____ <input type="checkbox"/> DoD <input type="checkbox"/> DOE <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Not Applicable	<b>Application or Project Type (Check all that apply)</b> <input type="checkbox"/> Full-scale cleanup <input type="checkbox"/> Field demonstration <input type="checkbox"/> Pilot-scale treatability study <input type="checkbox"/> Bench-scale treatability study <input type="checkbox"/> RCRA Research, Development, and Demonstration <input type="checkbox"/> TSCA National Demonstration <input type="checkbox"/> TSCA Research and Development <input type="checkbox"/> EPA SITE Demonstration Program <input type="checkbox"/> EPA SITE Emerging Technology Program <input type="checkbox"/> Research <input type="checkbox"/> Other (specify) _____	
<b>Media Treated (Check all that apply)</b>		
	<input type="checkbox"/> Soil (in situ) <input type="checkbox"/> Soil (ex situ) <input type="checkbox"/> Sludge <input type="checkbox"/> Solid (for example, slag) <input type="checkbox"/> Saturated sediment (in situ) <input type="checkbox"/> Saturated sediment (ex situ) <input type="checkbox"/> Ground water (in situ)	<input type="checkbox"/> Off-gas from a primary treatment technology <input type="checkbox"/> Dense nonaqueous phase liquids (DNAPL) [in situ] <input type="checkbox"/> Light nonaqueous phase liquids (LNAPL) [in situ] <input type="checkbox"/> Other: _____
<b>Volume/Quantity Treated</b>	<b>Equipment Scale (Check one only)</b>	<b>Project Status</b>
_____ (Units)	<input type="checkbox"/> Bench <input type="checkbox"/> Pilot <input type="checkbox"/> Full	<b>Contracted</b> Month(mm) _____ Year (yyyy) _____ <b>Ongoing</b> _____ Yes _____ No <b>Completed</b> Month(mm) _____ Year (yyyy) _____
<b>Area treated (for in situ projects)</b>		
_____ (Units)		
<b>Depth treated (for in situ projects)</b>		
_____ (Units)		

**Vendor Name** \_\_\_\_\_

**Technology Type** \_\_\_\_\_

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

**Note:**

- (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.
- (2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.
- (4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data						
(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	mg/kg	25 - 50	mg/kg	50	mg/kg
Conditions or interference adversely affecting performance _____ _____						
Cost Information						
Estimated or actual total and/or unit cost for this project  \$ _____ per _____ (unit)  \$ _____ (total)			What items or activities are included or not included in these cost(s) (for example, mobilization, demobilization, excavation, waste handling)? _____ _____ _____			
Person outside of company familiar with project (optional)  Name _____ Company _____  Address _____ _____ _____  Phone _____				Is Literature Available on this Project? (You may wish to include these citations in Part 6)  ___ Yes ___ No		
Additional project information such as site conditions, mode of operation, and other pertinent information. _____ _____ _____ _____						

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

6.4

Site Name (or Industry Type if Client Identity is Confidential): _____		
Site Type or Waste Source (Check all that apply)		
<input type="checkbox"/> Agriculture <input type="checkbox"/> Battery recycling/disposal <input type="checkbox"/> Chlor-alkali manufacturing <input type="checkbox"/> Coal gasification <input type="checkbox"/> Dry cleaning <input type="checkbox"/> Electroplating <input type="checkbox"/> Gasoline service station/petroleum storage facility <input type="checkbox"/> Herbicide manufacturing/use <input type="checkbox"/> Industrial landfills <input type="checkbox"/> Inorganic/organic pigments	<input type="checkbox"/> Machine shops <input type="checkbox"/> Medical wastes <input type="checkbox"/> Metal ore mining and smelting <input type="checkbox"/> Municipal landfill <input type="checkbox"/> Munitions manufacturing <input type="checkbox"/> Paint/ink formulation <input type="checkbox"/> Pesticide manufacturing/use <input type="checkbox"/> Petroleum refining /reuse <input type="checkbox"/> Photographic products <input type="checkbox"/> Plastics manufacturing <input type="checkbox"/> Pulp and paper industry <input type="checkbox"/> Other organic chemical manufacturing	<input type="checkbox"/> Other inorganic chemical manufacturing <input type="checkbox"/> Semiconductor manufacturing <input type="checkbox"/> Rubber manufacturing <input type="checkbox"/> Wood preserving <input type="checkbox"/> Uranium mining <input type="checkbox"/> Other (specify) _____
Location	Project took place at site named?	At another site (that is, a Test facility)?
City _____	_____ Yes	_____ Yes
State/Province: _____	_____ No	_____ No
Country _____		
Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	
<input type="checkbox"/> RCRA corrective action <input type="checkbox"/> CERCLA <input type="checkbox"/> TSCA <input type="checkbox"/> Safe Drinking Water Act <input type="checkbox"/> UST corrective action <input type="checkbox"/> State (specify) _____ <input type="checkbox"/> DoD <input type="checkbox"/> DOE <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Not Applicable	<input type="checkbox"/> Full-scale cleanup <input type="checkbox"/> Field demonstration <input type="checkbox"/> Pilot-scale treatability study <input type="checkbox"/> Bench-scale treatability study <input type="checkbox"/> RCRA Research, Development, and Demonstration <input type="checkbox"/> TSCA National Demonstration <input type="checkbox"/> TSCA Research and Development <input type="checkbox"/> EPA SITE Demonstration Program <input type="checkbox"/> EPA SITE Emerging Technology Program <input type="checkbox"/> Research <input type="checkbox"/> Other (specify) _____	
	Media Treated (Check all that apply)	
	<input type="checkbox"/> Soil (in situ) <input type="checkbox"/> Soil (ex situ) <input type="checkbox"/> Sludge <input type="checkbox"/> Solid (for example, slag) <input type="checkbox"/> Saturated sediment (in situ) <input type="checkbox"/> Saturated sediment (ex situ) <input type="checkbox"/> Ground water (in situ) <input type="checkbox"/> Off-gas from a primary treatment technology <input type="checkbox"/> Dense nonaqueous phase liquids (DNAPL) [in situ] <input type="checkbox"/> Light nonaqueous phase liquids (LNAPL) [in situ] <input type="checkbox"/> Other: _____	
Volume/Quantity Treated	Equipment Scale (Check one only)	Project Status
_____ (Units)	_____ Bench	Contracted
Area treated (for in situ projects)	_____ Pilot	Month(mm)_____ Year (yyyy) _____
_____ (Units)	_____ Full	Ongoing _____ Yes _____ No
Depth treated (for in situ projects)		Completed
_____ (Units)		Month(mm)_____ Year (yyyy) _____

**Vendor Name** \_\_\_\_\_

**Technology Type** \_\_\_\_\_

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

**Note:** (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

[illegible]

## PART 6: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

6.5

Site Name (or Industry Type if Client Identity is Confidential): _____		
Site Type or Waste Source (Check all that apply)		
<input type="checkbox"/> Agriculture <input type="checkbox"/> Battery recycling/disposal <input type="checkbox"/> Chlor-alkali manufacturing <input type="checkbox"/> Coal gasification <input type="checkbox"/> Dry cleaning <input type="checkbox"/> Electroplating <input type="checkbox"/> Gasoline service station/petroleum storage facility <input type="checkbox"/> Herbicide manufacturing/use <input type="checkbox"/> Industrial landfills <input type="checkbox"/> Inorganic/organic pigments	<input type="checkbox"/> Machine shops <input type="checkbox"/> Medical wastes <input type="checkbox"/> Metal ore mining and smelting <input type="checkbox"/> Municipal landfill <input type="checkbox"/> Munitions manufacturing <input type="checkbox"/> Paint/ink formulation <input type="checkbox"/> Pesticide manufacturing/use <input type="checkbox"/> Petroleum refining/reuse <input type="checkbox"/> Photographic products <input type="checkbox"/> Plastics manufacturing <input type="checkbox"/> Pulp and paper industry <input type="checkbox"/> Other organic chemical manufacturing	<input type="checkbox"/> Other inorganic chemical manufacturing <input type="checkbox"/> Semiconductor manufacturing <input type="checkbox"/> Rubber manufacturing <input type="checkbox"/> Wood preserving <input type="checkbox"/> Uranium mining <input type="checkbox"/> Other (specify) _____
Location City _____ State/Province: _____ Country _____	Project took place at site named? _____ Yes _____ No	At another site (that is, a Test facility)? _____ Yes _____ No
Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	
<input type="checkbox"/> RCRA corrective action <input type="checkbox"/> CERCLA <input type="checkbox"/> TSCA <input type="checkbox"/> Safe Drinking Water Act <input type="checkbox"/> UST corrective action <input type="checkbox"/> State (specify) _____ <input type="checkbox"/> DoD <input type="checkbox"/> DOE <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Not Applicable	<input type="checkbox"/> Full-scale cleanup <input type="checkbox"/> Field demonstration <input type="checkbox"/> Pilot-scale treatability study <input type="checkbox"/> Bench-scale treatability study <input type="checkbox"/> RCRA Research, Development, and Demonstration <input type="checkbox"/> TSCA National Demonstration <input type="checkbox"/> TSCA Research and Development <input type="checkbox"/> EPA SITE Demonstration Program <input type="checkbox"/> EPA SITE Emerging Technology Program <input type="checkbox"/> Research <input type="checkbox"/> Other (specify) _____	
	Media Treated (Check all that apply)	
	<input type="checkbox"/> Soil (in situ) <input type="checkbox"/> Soil (ex situ) <input type="checkbox"/> Sludge <input type="checkbox"/> Solid (for example, slag) <input type="checkbox"/> Saturated sediment (in situ) <input type="checkbox"/> Saturated sediment (ex situ) <input type="checkbox"/> Ground water (in situ)	<input type="checkbox"/> Off-gas from a primary treatment technology <input type="checkbox"/> Dense nonaqueous phase liquids (DNAPL) [in situ] <input type="checkbox"/> Light nonaqueous phase liquids (LNAPL) [in situ] <input type="checkbox"/> Other: _____
Volume/Quantity Treated	Equipment Scale (Check one only)	Project Status
_____ (Units)	<input type="checkbox"/> Bench <input type="checkbox"/> Pilot <input type="checkbox"/> Full	Contracted Month(mm) _____ Year (yyyy) _____ Ongoing <input type="checkbox"/> Yes <input type="checkbox"/> No Completed Month(mm) _____ Year (yyyy) _____
Area treated (for in situ projects)		
_____ (Units)		
Depth treated (for in situ projects)		
_____ (Units)		

[illegible]

**Note:**

- (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.
- (2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.
- (4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

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## PART 7: LITERATURE AND TECHNICAL REFERENCES

- 7.1 List and attach available documentation (for example, journal articles, conference papers, patents) that best describes technology and vendor capabilities. References that contain performance and cost data are of particular interest. **Do not include personal references.** EPA reserves the right to add to the list other publicly available references.

Author(s) _____	
Title _____	
Journal/Conference _____	
Date _____	NTIS/EPA Document Number(s) _____
Author(s) _____	
Title _____	
Journal/Conference _____	
Date _____	NTIS/EPA Document Number(s) _____
Author(s) _____	
Title _____	
Journal/Conference _____	
Date _____	NTIS/EPA Document Number(s) _____
Author(s) _____	
Title _____	
Journal/Conference _____	
Date _____	NTIS/EPA Document Number(s) _____
Author(s) _____	
Title _____	
Journal/Conference _____	
Date _____	NTIS/EPA Document Number(s) _____

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## APPENDIX A

### BUSINESS CLASSIFICATION INFORMATION

The following information is intended to be used as a reference to answer question 1.4. SIC code information and definitions are given below. To determine if your company is a small and/or disadvantaged business, first identify the Standard Industrial Classification (SIC) code for your company and secondly identify whether your company qualifies as a small business under that SIC code. Small and disadvantaged businesses are defined below.

#### Definition of SIC Code

**Standard Industrial Classification (SIC) Code** - refers to the four-digit number assigned by the government to classify establishments by the type of activity in which they are engaged. The codes are published by the Government in the Standard Industrial Classification Manual. The Manual is intended to cover the entire field of economic activities. It classifies and defines activities by industry categories and is the source used by the Small Business Administration (SBA) as a guide in defining industries for size standards. The number of employees or annual receipts indicates the maximum allowed for a concern, including its affiliates, to be considered small (Federal Acquisition Circular (FAC) 90-43, Interim Rule 61, Federal Register (FR) 67408, December 20, 1996, Federal Acquisition Regulation (FAR), 19.102(g)).

Most remediation firms should fall under one of the SIC codes defined below.

The following SIC code definitions are taken from the Standard Industrial Classification Manual, 1987, Office of Management and Budget.

*SIC code 4953: Refuse Systems (i.e., activities related to actual site cleanup)* Establishments primarily engaged in the collection and disposal of refuse by processing or destruction or in the operation of incinerators, waste treatment plants, landfills, or other sites for disposal of such materials. Establishments primarily engaged in collecting and transporting refuse without such disposal are classified in Transportation, Industry 4212.

- Acid waste, collection and disposal of
- Ashes, collection and disposal of
- Dumps, operation of
- Garbage: collecting, destroying, and processing
- Hazardous waste material disposal sites
- Incinerator operation
- Landfill, sanitary: operation of
- Radioactive waste materials, disposal of
- Refuse systems
- Rubbish collection and disposal
- Sludge disposal sites
- Street refuse systems
- Waste materials disposal at sea

*SIC code 8711: Engineering Services (i.e., activities related to remedial investigations, feasibility studies, and remedial design)* Establishments primarily engaged in providing professional engineering services. Establishments primarily providing and supervising their own engineering staff on temporary

contract to other firms are included in this industry. Establishments providing engineering personnel, but not general supervision, are classified in Industry 7363. Establishments primarily engaged in providing architectural engineering services are classified in Industry 8712, and those providing photogrammetric engineering services are classified in Industry 8713.

- Designing ship, boat, and machine
- Engineering services: industrial, civil, electrical, mechanical, petroleum, marine, and design
- Machine tool designers
- Marine engineering services
- Petroleum engineering services

#### Definitions of Small and Disadvantaged Business

The following small business size standards established by the SBA are taken from FAR 19.102.

SIC Code	Description	Size
4953	Refuse Systems .....	\$6.0 million
8711	Engineering Services	
	Military and Aerospace Equipment	
	and Military Weapons .....	\$20.0 million
	Marine Engineering and Naval Architecture .....	\$13.5 million
	Other Engineering Services .....	\$2.5 million

The following information is taken from FAR Parts 19-26, Socioeconomic Programs

**Small business concern** - means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on government contracts, and qualified as a small business under the criteria and size standards in 13 CFR Part 121 (FAR Section 19.102). Such a concern is "not dominant in its field of operation" when it does not exercise a controlling or major influence on a national basis in a kind of business activity in which a number of business concerns are primarily engaged. In determining whether dominance exists, consideration shall be given to all appropriate factors, including volume of business, number of employees, financial resources, competitive status or position, ownership or control of materials, processes, patents, license agreements, facilities, sales territory, and nature of business activity.

**Small disadvantaged business concern** - means a small business concern that is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business that has at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business that has at least 51 percent of its stock unconditionally owned by one of these entities, that has its management and daily business controlled by

members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and that meets the requirements of 13 CFR 124.

(a) "Socially disadvantaged individuals" means individuals who have been subjected to racial or ethnic prejudice or cultural bias because of their identify as a member of a group without regard to their qualities as individuals.

(b) "Economically disadvantaged individuals" means socially disadvantaged individuals whose ability to compete in the free enterprise system is impaired due to diminished opportunities to obtain capital and credit as compared to others in the same line of business who are not socially disadvantaged. Individuals who certify that they are members of named groups (Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent-Asian Americans) are to be considered socially and economically disadvantaged.

(1) "Subcontinent Asian Americans" means United States citizens whose origins are in India, Pakistan, Bangladesh, Sri Lanka, Bhutan, or Nepal.

(2) "Asian Pacific Americans" means United States citizens whose origins are in Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, or the Federated States of Micronesia.

(3) "Native Americans" means American Indians, Eskimos, Aleuts, and Native Hawaiians.

(c) "Native Hawaiian Organization" means any community service organization serving Native Hawaiians in, and chartered as a not-for-profit organization by, the State of Hawaii, which is controlled by Native Hawaiians, and whose business activities will principally benefit such Native Hawaiians.

(d) "Indian tribe" means any Indian tribe, band, nation, or other organized group or community of Indians, including any Alaska Native Corporation as defined in 13 CFR 124.100 which is recognized as eligible for the special programs and services provided by the U.S. to Indians because of their status as Indians, or which is recognized as such by the State in which such tribe, band, nation, group, or community resides.

**Women-owned small business concern** - means a small business concern which is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

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## APPENDIX B

### KEY TO CONTAMINANT GROUPS

#### CONTAMINANT GROUP CODES FOR HAZARDOUS SUBSTANCES LIST

##### Organic

- A** Halogenated volatiles
- B** Halogenated semivolatiles
- C** Nonhalogenated volatiles
- D** Nonhalogenated semivolatiles
- E** Organic pesticides/herbicides
- F** Dioxins/furans
- G** PCBs
- H** Polynuclear aromatics (PNAs)
- I** Solvents
- J** Benzene-toluene-ethylbenzene-xylene (BTEX)
- K** Organic cyanide
- L** Organic corrosives

##### Inorganic

- M** Heavy metals
- N** Nonmetallic toxic elements (As, F)
- O** Radioactive metals
- P** Asbestos
- Q** Inorganic cyanides
- R** Inorganic corrosives

##### Miscellaneous

- S** Explosives/propellants
- T** Organometallic pesticides/herbicides

# HAZARDOUS SUBSTANCES

## Organic Contaminant Group

### CAS No.

208968	Acenaphthylene	H
83329	Acenaphthene	H
75070	Acetaldehyde	C,I
67641	Acetone	C,I
75058	Acetonitrile	C,K
98862	Acetophenone	D
591082	Acetyl-2-thiourea, 1	D
107028	Acrolein	C
79061	Acrylamide	D
79107	Acrylic acid	C
107131	Acrylonitrile	C,K
124049	Adipic acid	D
116063	Aldicarb	E,D
309002	Aldrin	E,B
107186	Allyl alcohol	C,I
62533	Aniline	D
120127	Anthracene	H
1912249	Atrazine	E,B
2642719	Azinphos-ethyl	E,D
86500	Azinphos-methyl	E,D
151564	Aziridine	C,L
56553	Benz (a) anthracene	H
71432	Benzene	J
98884	Benzene carbonyl chloride	B,L
92875	Benzidine	D
205992	Benzofluoranthene,3,4-	H
65850	Benzoic acid	D
100470	Benzonitrile	C,I,K
95169	Benzothiazole,1,2-	K
50328	Benzo (a) pyrene	H
206440	Benzo (j,k) fluorene	H
207089	Benzo (k) fluoranthene	H
100447	Benzyl chloride	A
111911	Bis (2-chloroethoxy) methane	B
111444	Bis (2-chloroethyl) ether	B
117817	Bis (2-ethyl hexyl) phthalate	D
542881	Bis (chloromethyl) ether	B
75274	Bromodichloromethane	A
74964	Bromomethane	A

### CAS No.

1689845	Bromoxynil	E,K,B
106990	Butadiene, 1,3-	C
71363	Butanol	C
85687	Butylbenzyl phthalate	D
94826	Butyric acid, 4-2(2,4-dichlorop)	E,B
133062	Captan	B,E
63252	Carbaryl	E,D
1563662	Carbofuran	E,D
75150	Carbon disulfide	C,I
56235	Carbon tetrachloride	A,I
78196	Carbophenothion	E
75876	Chloral	A
57749	Chlordane	E,B
106478	Chloroaniline, p-	B
108907	Chlorobenzene	A
67663	Chloroform	A
74873	Chloromethane	A
107302	Chloromethyl methyl ether	A
106898	Chloromethyloxirane, 2-	I,A
91587	Chloronaphthalene, 2-	B
95578	Chlorophenol, 2-	B
59507	Chloro-3-methylphenol, 4-	B
2921882	Chloropyrifos	E,D
218019	Chrysene	H
56724	Coumaphos	E,D
8021394	Creosote	H
108394	Cresol, m-	D
106445	Cresol, p-	D
98828	Cumene	C,I
21725462	Cyanazine	E,K,B
110827	Cyclohexane	C,I
108941	Cyclohexanone	C,I
72548	DDD	E,B
72559	DDE	E,B
50293	DDT	E,B
78488	DEF	E,D
333415	Diazinon	E,D
132649	Dibenzofuran	D,H

**Organic Contaminant Group (continued)****CAS No.**

53703	Dibenz (a,h) anthracene	H
124481	Dibromachloromethane	A
96128	Dibromo-3-chloropropane, 1,2-	A,E
106934	Dibromoethane, 1,2-	A,E,I
1918009	Dicamba	A,B
95501	Dichlorobenzene, 1,2-	B
541731	Dichlorobenzene, 1,3-	B
106467	Dichlorobenzene, 1,4-	B
91941	Dichlorobenzidine, 3,3-	B
75718	Dichlorodifluoromethane	A
75343	Dichloroethane, 1,1-	A
107062	Dichloroethane, 1,2-	A
75354	Dichloroethene, 1,1-	A
156592	Dichloroethylene, cis-1,2-	A
156605	Dichloroethylene, trans-1,2-	A
120832	Dichlorophenol, 2,4-	B
94757	Dichlorophenoxyacetic acid, 2-	E,B
78875	Dichloropropane, 1,2-	A
542756	Dichloropropene, 1,3-	A
62737	Dichlorvos	E,A
115322	Dicofol	E,B
60571	Dieldrin	E,B
84662	Diethyl phthalate	D
111466	Diethylene glycol	D,I
1660942	Diisopropylmethylphosphonate	D
60515	Dimethoate	E,D
119904	Dimethoxybenzidine, 3,3-	D
105679	Dimethyl phenol, 2,4-	D
13113	Dimethyl phthalate	D
77781	Dimethyl sulfate	C
99650	Dinitrobenzene, 1,3-	D
51285	Dinitrophenol, 2,4-	D
121142	Dinitrotoluene, 2,4-	D,S
606202	Dinitrotoluene, 2,6-	D,S
88857	Dinoseb	E,D
123911	Dioxane, 1,4	C,I
78342	Dioxathion	E,D
122667	Diphenylhydrazine, 1,2-	D
85007	Diquat	E,D
298044	Disulfoton	C,E
330541	Diuron	E,D

**CAS No.**

84742	Di-n-butyl phthalate	D
117840	Di-n-octyl phthalate	D
115297	Endosulfan	E,B
959988	Endosulfan i	E,B
33212659	Endosulfan II	E,B
1031078	Endosulfan sulfate	E,B
145733	Endothall	E,D
72208	Endrin	E,B
7421934	Endrin aldehyde	E,B
563122	Ethion	E,D
141786	Ethyl acetate	C,I
100414	Ethyl benzene	J
75003	Ethyl chloride	A,I
60297	Ethyl ether	C,I
107211	Ethylene glycol	I,D
110805	Ethylene glycol monoethyl ether	D,I
759944	Ethylpropylthio carbamate, S-	E,D
122145	Fenitrothion	E,D
86737	Fluorene	H
50000	Formaldehyde	C,L
64186	Formic acid	C
110009	Furan	I,C
98011	Furfural	I,C
765344	Glycidyaldehyde	C
76448	Heptachlor	B,E
1024573	Heptachlor epoxide	B,E
118741	Hexachlorobenzene	B,E
87683	Hexachlorobutadiene	B,I
60873	Hexachlorocyclohexane, alpha-	E,B
60873	Hexachlorocyclohexane, beta-	E,B
60873	Hexachlorocyclohexane, delta-	E,B
77474	Hexachlorocyclopentadiene	B
67721	Hexachloroethane	B
70304	Hexachlorophene	B
110543	Hexane	C,I

**Organic Contaminant Group (continued)**

**CAS No.**

1689834	Ioxynil .....	E,K,B
78831	Isobutanol .....	C,I
78591	Isophorone .....	D,I
143500	Kepone .....	E,B
58899	Lindane .....	E,B
121755	Malathion .....	B,E
108316	Maleic anhydride .....	D
123331	Maleric hydrazide .....	E,D
126987	Methacrylonitrile .....	C,K
67561	Methanol .....	C,I
16752775	Methomyl .....	E,D
72435	Methoxychlor .....	B,E
79221	Methyl chlorocarbonate .....	C,L
78933	Methyl ethyl ketone .....	C,I
108101	Methyl isobutyl ketone .....	C,I
80626	Methyl methacrylate .....	C
101144	Methylene bis (2-chloroaniline) .....	B
75092	Methylene chloride .....	A,I
23855	Mirex .....	E,B
91203	Naphthalene .....	H
100016	Nitroaniline, p- .....	D
98953	Nitrobenzene .....	D
100027	Nitrophenol, 4- .....	D
1116547	Nitrosodiethanolamine, n- .....	D
55185	Nitrosodiethylamine, n- .....	D
62759	Nitrosodimethylamine, n- .....	D
86306	Nitrosodiphenylamine, n- .....	D
930552	Nitrosopyrrolidine, n- .....	D
924163	Nitroso-di-n-butylamine, n- .....	D
615532	Nitroso-di-n-methylurethane, n- .....	D
99990	Nitrotoluene, 4- .....	D
56382	Parathion, ethyl- .....	E,D
298000	Parathion, methyl- .....	E,D
1336363	PCBs .....	G
608935	Pentachlorobenzene .....	B
76017	Pentachloroethane .....	A

**CAS No.**

82688	Pentachloronitrobenzene .....	B
87865	Pentachlorophenol .....	B,E
85018	Phenanthrene .....	H
108952	Phenol .....	D
139662	Phenyl sulfide .....	D
62384	Phenylmercuric acetate .....	E,T
298022	Phorate .....	C,E
75445	Phosgene .....	A,E,L
13171216	Phosphamidon .....	E,D
85449	Phthalic anhydride .....	D
23950585	Pronamide .....	D
129000	Pyrene .....	H
110861	Pyridine .....	C,I
91225	Quinoline .....	H
108463	Resorcinol .....	D
299843	Ronnel .....	E,B
57249	Strychnine .....	E,H
100425	Styrene .....	C
746016	TCDD .....	F
95943	Tetrachlorobenzene, 1,2,4,5- .....	B
630206	Tetrachloroethane, 1,1,1,2- .....	A,E,I
79345	Tetrachloroethane, 1,1,2,2- .....	A,E,I
127184	Tetrachloroethene .....	A,I
58902	Tetrachlorophenol, 2,3,4,6 .....	B
3689245	Tetraethyldithiopyrophosphate .....	E,D
109999	Tetrahydrofuran .....	C,I
137268	Thiram .....	E,D
108883	Toluene .....	J
584849	Toluene diisocyanate .....	D,L
8001352	Toxaphene .....	B,E
93721	TP, 2,4,5- (Silvex) .....	E,B
75252	Tribromomethane .....	A
120821	Trichlorobenzene, 1,2,4- .....	B
71556	Trichloroethane, 1,1,1- .....	A,I
79005	Trichloroethane, 1,1,2- .....	A,I
79016	Trichloroethylene .....	A
75694	Trichlorofluoromethane .....	A,I

### Organic Contaminant Group (continued)

#### CAS No.

933788	Trichlorophenol, 2,3,5- .....	B
95954	Trichlorophenol, 2,4,5- .....	B
88062	Trichlorophenol, 2,4,6- .....	B
609198	Trichlorophenol, 3,4,5- .....	B
93765	Trichlorophenoxyacetic acid, 2,4,5- ..	E,B
933788	Trichloro-1,2,2-trifluoroethane .....	A,I
27323417	Triethanolamine .....	D
126727	Tris (2,3-dibromopropyl) phosphate ..	B
108054	Vinyl acetate .....	C
75014	Vinyl chloride .....	A
81812	Warfarin .....	E,D
108383	Xylene, m- .....	J
95476	Xylene, o- .....	J
106423	Xylene, p- .....	J

#### Inorganic Contaminant Group

7429905	Aluminum .....	X
20859738	Aluminum phosphide .....	N
7440360	Antimony .....	M
7440382	Arsenic .....	M
1327533	Arsenic trioxide .....	M
1303339	Arsenic trisulfide .....	M
7440393	Barium .....	M
542621	Barium cyanide .....	M,Q
7440417	Beryllium .....	X
7440439	Cadmium .....	M
13765190	Calcium chromate .....	M
7778543	Calcium hypochlorite .....	R
1333820	Chromic acid .....	M,R
7440473	Chromium .....	M
	Chromium (III) .....	M
	Chromium (VI) .....	M
7440484	Cobalt .....	M
7440508	Copper .....	M
544923	Copper cyanide .....	M,Q

#### CAS No.

7720787	Ferrous sulfate .....	M
7439896	Iron .....	M
7439921	Lead .....	M
7439965	Manganese .....	M
7439976	Mercury .....	M
7440020	Nickel .....	M
7718549	Nickel chloride .....	M
10102440	Nitrogen dioxide .....	R
7803512	Phosphine .....	N
7789006	Potassium chromate .....	M
151508	Potassium cyanide .....	Q
506616	Potassium silver cyanide .....	M,Q
7783008	Selenious acid .....	N,R
7782492	Selenium .....	N
7440224	Silver .....	M
506649	Silver cyanide .....	M,Q
7440235	Sodium (metallic) .....	R
26628228	Sodium azide .....	S
7681494	Sodium fluoride .....	N
7775113	Sodium chromate .....	M
143339	Sodium cyanide .....	Q
1310732	Sodium hydroxide .....	R
1314325	Thallic oxide .....	M
7440280	Thallium .....	M
563688	Thallium acetate .....	M
6533739	Thallium carbonate .....	M
7791120	Thallium chloride .....	M
10102451	Thallium nitrate .....	M
12039520	Thallium selenide .....	M
7446186	Thallium (I) sulfate .....	M
7440291	Thorium .....	O

**Inorganic Contaminant Group (continued)**

**CAS No.**

1314621	Vanadium pentoxide .....	M,R
7440666	Zinc .....	X
557211	Zinc cyanide .....	Q
1314847	Zinc phosphide .....	N
7733020	Zinc sulfate .....	X

**Explosive/Propellants**

7664417	Ammonia .....	R
131748	Ammonium picrate .....	S
7773060	Ammonium sulfamate .....	S
460195	Cyanogen .....	S,E
2691410	Cyclotetramethylenetetranitramine ...	S
302012	Hydrazine .....	S
55630	Nitroglycerine .....	S
99990	Nitrotoluene, 4- .....	S
26628228	Sodium azide .....	S
99354	Trinitrobenzene, 1,3,5 .....	S
118967	Trinitrotoluene .....	S

**Organometallic Compound**

63294	Phenylmercurie acetate .....	E,T
630104	Selenourea .....	N
78002	Tetraethyl lead .....	M